

**Remarks**

The undersigned thanks the Examiner for the May 13, 2004, telephone conference in which the undersigned further explained the disclosure of the Cooper reference. In particular, the undersigned explained that the Cooper reference does not disclose a system for 3D modeling of real-world objects (as recited by the claims of the present application), but rather, Cooper is directed to a system for video editing (and, in particular, a system for the creation of visual effects by projecting video on a projection plane that can be animated in a 3D space). During the May 13, 2004, telephone conference, the parties also discussed amending the claims to further distinguish the cited prior art. During those discussions, and in response to language proposed by the undersigned, the Examiner indicated that claim language clarifying that the modeled objects are "real-world objects" would further distinguish the cited prior art and advance the prosecution of the present application. The claims have been amended in line with those discussions.

3. Claims 1-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cooper et al (5729673) and Bronfeld et al (6308144) and Szeliski (6137491).

The claims have been amended to make clear that what is being claimed is a CAD/CAM software control method that includes forming a two dimensional drawings of a three dimensional computer defined graphical model of a real-world object.

The Examiner's rejection is respectfully traversed. Neither Cooper, Bronfeld, nor Szeliski, alone or in combination, teach or suggest a CAD/CAM software control method that includes generating a two-dimensional drawing from a three-dimensional computer defined model of a real-world object; based on the three-dimensional model, automatically generating descriptive information associated with a displayed component of the two-dimensional drawing; forming a user interface for controlling the addition of the descriptive information to the two-dimensional drawing; adding the descriptive information to the two-dimensional drawing responsive to interactive user input data entered at the user interface to select a first subset of the automatically generated descriptive information that is to be added to the two-dimensional drawing, wherein the descriptive information added to the two-dimensional drawing is

configured for display in the two-dimensional drawing, all in the manner recited by claim 1.

Generally speaking, applicant's claimed inventions provides tools for adding descriptive information that go beyond those currently available to CAD/CAM users. In one aspect, the invention provides a method to add descriptive information to a 2D drawing in a step-by-step fashion during the process of creating a 2D drawing from a 3D model. A user interface may be provided to control the addition of the descriptive information during the 2D drawing generation phase. The user can halt the process during execution (e.g., by pressing a pause button) or can use a semi-automatic mode where a new item is added periodically (with the period being long enough for the user to halt and control the addition of information during the process). Furthermore, in some realizations, the system is configured to track the user commands to select which modifications are or are not made so that during subsequent generations of the 2D drawing, the user's prior modifications will be reapplied without asking for the end-user assistance. The foregoing description was provided as general background to the claims. Not all of the foregoing features are present in each claim and, accordingly, each claim should be examined and interpreted based on the actual claim language.

What Cooper discloses is a system for use in a video editing environment. In response to a prior office action, the undersigned stated that Cooper was understood as teaching a "system [that] can be used to create 2D projections from a 3D model and can be used to manipulating those projections (e.g., by altering the position of a surface plane on which the model is projected." The undersigned has again reviewed Cooper and believes this statement was not accurate. In particular, the undersigned's believes he incorrectly understood Cooper as teaching or suggesting a system used to create a 2D projection from a 3D model of an object. The undersigned's current understanding was explained to the Examiner during the parties' May 13, 2004, telephone conference is summarized below.

What Cooper teaches is a system used to display "transitions" between scenes in a video production. Generally speaking, a movie or other video production consists of a number of film clips, or "scenes," that are joined together to produce an entire film or video. For example, a title

scene may precede an action scene. When producing video, “transitions” are often used between scenes. A familiar transition is a fade-in or fade-out transition. In a fade-in or fade-out transition, video images from a first scene (e.g., the title scene) are combined in an overlapping manner with video images from a second scene (e.g., the action scene) for a period of time such that the first scene (i.e., the title scene) fades away while the second scene (i.e., the action scene) fades into view. What Cooper teaches is a particular system for generating more sophisticated types of video transitions. Cooper provides for transitions in which a first scene (i.e., the title scene) is projected onto a plane 112 that can be moved in three dimensional space as a second scene (i.e., the action scene) is viewed in area 102. Cooper’s result is, e.g., a title that is displayed on plane 112 moving against an action background displayed in area 102 such that the first scene (the title) can be moved, skewed, enlarged, shrunk, or moved out of the view 102 by manipulation of the projection plane 112. The undersigned respectfully submits that video transition technology is not related to the CAD/CAM modeling techniques claimed in the present application and, accordingly, Cooper should not be considered prior art with respect to the inventions claimed in the present application.

**4. Regarding claim 1, Cooper et al show the software control method for forming a two dimensional view of a computer defined graphical model (Figure 5, column 1 lines 34-45),**

Contrary to the Examiner’s suggestion, Cooper does not teach a three-dimensional model (and, more particularly, does not teach a three-dimensional model of a real-world object). To the extent, if any, that Cooper can be understood as teaching a three-dimensional model, Cooper’s model is not that of a real-world object such as would be modeled in a CAD/CAM system (e.g., a mechanical device or other physical object), but rather, Cooper is understood as merely providing for a “model” of the motion of the two-dimensional projection plane 112 in three dimensional space. That is, Cooper’s plane 112 appears to be a two-dimensional plane that is merely moved and positioned in a three-dimensional space. Cooper’s plane 112 is not a three-dimensional model of a real-world object as recited in the claims of the present application. Accordingly, the cited text of Cooper does not support the Examiner’s rejection under § 103.

**[Cooper discloses] generating a descriptive information associated with a component of the two dimensional view (column 4 lines 35-53, column 5 lines 5-16),**

It is respectfully submitted that Cooper does not teach generating descriptive information associated with a component of the two dimensional view. Furthermore, the undersigned points out that claim 1, itself, does not merely require generating descriptive information, but also requires that such generation be “based on the three-dimensional model [of the real-world object].”

The Examiner’s cites to Col. 4, lines 35-53, and col. 5, lines 5-16 are inapposite. These cited sections relate to user-control and manipulation of Cooper’s projection plane 112, rather than to the generation of descriptive information based on that plane itself. Claim 1’s generation “based on the model” would allow, e.g., a precise measurement of a part to be determined based on a three-dimensional model of that part and that measurement would then be associated with the two-dimensional drawing of that part. As understood by the undersigned, Cooper’s “key frames” are not information derived from the plane 112 itself, but rather, are information used to specify how that the projection plane 112 is, at various points in time, positioned within three-dimensional space. Accordingly, the cited text of Cooper does not support the Examiner’s rejection under § 103.

Distinctions between “key frame” usage in Cooper and the descriptive information of the current applicaiton was further explained to the Examiner during the parties May 13 telephone conference. Based on that conversation, the undersigned usnderstands that the Examiner now recognizes that these concepts are dissimilar; however, if any uncertainty remains, or the Examiner still questions whther these concepts can be compared, the Examiner is invited to call the undersigned for an additional explanation of key frame usage and how it differs from the claimed descriptive information.

[Cooper discloses] adding the drawing item to the view responsive to user activation (column 5 lines 15-37).

What claim 1 recites is that descriptive information generated from a three-dimensional model of a real-world object be added to a two-dimensional drawing responsive to user input data. For example, a dimension of a part may be determined from a three-dimensional model of a mechanical component (a real-world object) and, based on user input, the user may determine

whether that dimension is to be shown in a generated two-dimensional drawing of that real-world object. Contrary to the Examiner's suggestion, this is not what is shown at Col. 5, lines 15-37 of Cooper. What col. 5, lines 15-37 show is merely the provisioning of key frame data at a user interface to control the movement of the plane 112 in three-dimensional space. Furthermore, claim 1 requires that the descriptive information added to the two-dimensional drawing be for display in the two-dimensional drawing. Nowhere does Cooper disclose or suggest that this key frame data is information that is displayed in the two-dimensional drawing as recited by claim 1. Accordingly, the cited text of Cooper does not support the Examiner's rejection under § 103.

**Cooper et al do not specifically describe forming a user interface to control the addition, but do mention convenient ways to edit the model using an interface (column 5 lines 37-55). Furthermore, Bronfeld et al do show a CAD/CAM system for forming the separate sketcher plane interface to add a drawing item to a model (column 10 lines 49-67). This is done fore convenient editing of the model. It would have been obvious to a person with ordinary skill in the art to have this feature in Cooper et al, because it would provide a convenient way to edit a model. Neither Cooper et al nor Bronfeld et al may show the exact details of the user interaction to input data to select a a first subset of automatically generated descriptive information to be added to the two-dimensional view for subsequent configuration in the two dimensional view, but do show the flexibility of manipulating the views.**

What Bronfeld dicloses is a CAD/CAM system using a "sketcher plane" to position items being added to a three dimensional model. Bronfeld's "sketcher plane" is understood as being a tool used to enable manual addition of objects to the three dimensional model and is not a process for automatically generating descriptive information based on a three-dimensional model and associating that information with a two-dimensional view as recited by the claims of the present invention. It is not at all clear why the Examiner has combined Bronfeld with Cooper as Bronfeld's sketcher plane, as understood by the undersigned, relates to the creation of a three-dimensional model, but does not appear to be related to the creation of a two-dimensional drawing from a three-dimensional model where data generated based on that three-dimensional model is to be selectively added or excluded from the two-dimensional drawing as recited by claim 1. It is respectfully submitted that, to the extent that a combination of Bronfeld with Cooper can be interpreted to suggest any features of the claimed invention, the suggestion to make such a combination is based on hindsight resoning derived from the present application. Such hindsight reasoning is not a valid grounds for combination of prior art references under § 103.

Furthermore, Szelinski shows this (Figure 5, column 12 lines 10-38, column 14 lines 39-58) for flexibility of manipulating the views. It would have been obvious to have this capability in the system expressed by Cooper et al as enhanced by Bronfeld et al, because it would allow a convenient flexibility of manipulating the views.

The relevance of Szelinski is not understood by the undersigned. What Szelinski teaches is a method for reconstructing a three-dimensional object based on two-dimensional views of that object. For example, if a user has two two-dimensional views of a three-dimensional object, but does not have an original data file representing the three-dimensional object itself, the teachings of Szelinski can be used to reconstruct data representing the three-dimensional object. Szelinski does not teach any kind of user interface for use where a three-dimensional model is processed to generate two-dimensional drawings and descriptive information generated based on the three-dimensional model is added to the drawings. The undersigned respectfully submits that any suggestion to combine Szelinski with Bronfeld and Cooper to obtain the claimed inventions is obtained only from the undersigned's application and, as such, such a combination is improper under § 103.

### Conclusion

Because neither Cooper nor Bronfeld nor Szelinski, alone or in combination, teach or suggest all elements of the recited claims (including, e.g., the automatic generation of descriptive information based on a three-dimensional model of a real-world object and the addition of descriptive information responsive to interactive user input data entered at a user interface to select to select a subset of the automatically generated descriptive information that is to be added to the two dimensional view), rejection of claims under 35 U.S.C. § 103(a) in light of Cooper, Bronfeld, and Szelinski is improper. Accordingly, it is requested that the Examiner withdraw his rejection and allow all of the claims.

5. Regarding claim 2, Bronfeld et al show that the drawing feature is a dimension (column 10 lines 50-65). Also, Szediski shows the constraint (column 18 lines 35-48).

For clarity, Claim 2 has been amended to recite that the descriptive information comprises a "measurement." The cited text of Bronfeld does not show that descriptive

information comprising a measurement is generated based on a three-dimensional model of a real-world object and that measurement is added to a two-dimensional drawing formed from that model such that the measurement is displayed in the two-dimensional drawing.

Furthermore, while the cited text of Szeliski does discuss constraints, the context in which the cited constraints are discussed is not related to a constraint generated based on a three-dimensional model of a real-world object nor are the disclosed constraints added to a two-dimensional drawing formed from that model such that the constraint is displayed in the two-dimensional drawing. Szeliski's constraints are constraints used for the generation of a three-dimensional model; they are not constraints generated from a three-dimensional model as are the constraints of claim 2. Accordingly, Szeliski's constraints simply are not related to those claimed in the present application.

For at least these additional reasons, the Examiner's rejection of claim 2 under § 103 is not supported by the cited prior art and it is respectfully requested that the Examiner's rejection be withdrawn.

**6. Regarding claims 3-4, the descriptive information is added after an expiration time if the system is not paused (Cooper et al column 4 lines 35-50).**

The cited text of Cooper is not related to a process for adding descriptive information semi-automatically responsive to the expiration of a predetermined time-out period. What the cited text relates to is timing of transitions between scenes being edited in a video editing system. This is not the addition of descriptive information as recited by claims 3-4. The two technologies are simply not related.

For at least these additional reasons, the Examiner's rejection of claims 3-4 under § 103 is not supported by the cited prior art and it is respectfully requested that the Examiner's rejection be withdrawn.

**8. Regarding claim 6, user input data is tracked so that a second subset of information will not appear in the subsequent views (Bronfeld et al abstract, column 15 lines 15-42, column 16 lines 33-50).**

9. Regarding claim 7, the descriptive information is stopped and an additional view is formed (Bronfeld et al column 16 lines 43-65).

10. Regarding claim 8, a modification is reproduced in a two dimensional view (Bronfeld et al column 16 lines 42-65).

Contrary to the Examiner's suggestion, the cited text of Bronfeld does not disclose tracking whether or not descriptive information generated from a three-dimensional model is to be added or not added to two-dimensional drawings that are subsequently generated. What Bronfeld teaches is merely that history data can be used during a model generation. For example, at col. 16, lines 33-50, Bronfeld teaches that history information can be used to determine whether a sketch was, in fact, applied to a 3D model. However, Bronfeld does not go so far as to recite the particular use of history information recited in claim 6 of the present application. Furthermore, Bronfeld does not teach the formation of two-dimensional drawings from 3D models of real-world objects, as recited in the present claims. Accordingly, for at least this additional reason, rejection of claims 6-9 under § 103 is not supported by the cited prior art.

11. Regarding claim 9, the descriptive information may be added automatically or with user intervention (column 16 lines 1-22).

12. Regarding claims 10-12, the drawing mode may be paused in which a user may modify data and generate data (Bronfeld et al column 16 lines 33-55).

13. Regarding claims 13-14, drawing data views may be filtered from being formed (column 16 lines 50-65 of Bronfeld et al).

With regard to paragraphs 11-13 of the Office Action, it is not clear how the cited text supports the Examiner's position. With respect to claim 9, column 16, lines 1-22 does not appear to relate to the addition of descriptive information generated from a 3D model of a real-world object to a two-dimensional drawing generated from that same model. With respect to claims 10-12, these claims relate to the integration of user input into the automated generation process recited by claim 1. The cited text does not appear to be so related. With respect to claims 13-14, these claims related to the inhibiting of particular 2D drawings from being formed. It is not clear how the cited text of Bronfeld relates to such a function and it is respectfully submitted that the cited text does not so relate. Further explanation from the Examiner is respectfully requested.

Response to Office Action,  
U.S. Application No. 09/329,923  
Our Ref.: 5974-010

**Conclusion**

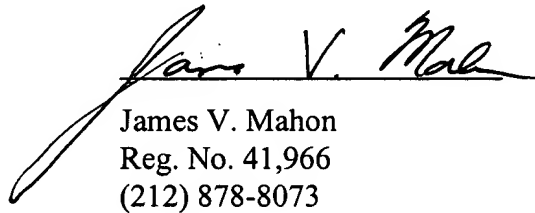
Claims 1-23 are now pending and believed to be in condition for allowance. Applicant respectfully requests that all pending claims be allowed.

Please apply any credits or excess charges to our deposit account number 50-0521.

Respectfully submitted,

Date:

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